

Coal Producing Regions in Japan-a study of regions under government plannings

著者	NOH Toshio
雑誌名	The science reports of the Tohoku University. 7th series, Geography
巻 号	17 1
ページ	61-92
発行年	1968-03
URL	http://hdl.handle.net/10097/44897

Coal Producing Regions in Japan

— a study of regions under government regional plannings —

Toshio NOH

I. Geographic regions and regional plannings.

A geographic region is the product of joint work by men and the nature. The nature as environment, strongly conditions the limits and bounds of men's activity on the earth's surface, and this is the proposition in which geography has traditionally been interested. On the other hand, men as an agent, is also an important factor in making the characteristics of a region. In the analysis of a geographic region, the men and the nature must be treated with the same values only because we have no standard to evaluate the relative weight of contributions made by these two kinds of agents. Nevertheless, the recent development of modern technology made the men's role in changing the surface of the earth overwhelmingly large. Men are no more the poor existence at the mercy of the cruel persecution by the nature, but are the proud reorganizers of the nature. However, the danger of missinterpretation is involved in the changes themselves. Men have been changing the nature since the beginning of their civilization, and what we now feel overwhelmingly strong might be an illusion affected by the fact that we are living within it.

It is the objective of the present author to analyze the role of men in the theater of geographic regions. There, men are using modern technology as their tool, and regional planning as their method to command the technology. In this study, the author's interest is directed to the role of regional plannings in this sense, and for that purpose, he is going to make study of regions under government plannings. In this country, there are many regional plannings designed by the government, by means of which government policies are forcibly put into practice with national budgets to support them. To mention a few of the examples, there are the Special Areas for the Multi-purpose Development Regions (1951), Coal Producing Regions (1961), New Industrial Cities (1963), Special Regions for Industrial Development (1963), and Regions designated by the Remote Islands Development Act, and many others. If such regional plannings are well composed and the programs are promoted forcibly, the regions under such programs will be changed into regions of very different characteristics. Usually such changes are considered to be the

development, but very often undesirable effects also accompanied the development. For this reason, it is a matter of critical importance that the plan-makers in the government bureaux will understand the basic nature of geographic regions and the ways they change.

The concept of a region is vague and varied. A region designated by law is not always a region in a geographic sense. The discrepancy of concepts often confuses the understanding of regions in area studies and in regional plannings. From a geographic standpoint, the author tries to analyze the changes which are taking place in the coal producing regions of Japan under government policies. He is not so optimistic as to expect that he will be able to solve this problem which is the fundamental subject of the science of geography. He only hopes that by this means he will be able to explain a case in which the two agents, the men and the nature, work together with rather an exceptional combination.

II. Recent changes in the coal producing regions of Japan.

As a small country of 370,000 square kilometers, Japan is fairly well endowed with coal resources. Before the Second World War, her annual output was about 35-45 million tons. Her major coal fields are in Northern Kyūshū and Hokkaidō. Jōban coal fields follow the two with a considerably smaller output. Coal fields in Yamaguchi prefecture come to the fourth with their production of anthracite which is rare in this country.

During the war, increased production of coal was encouraged to the utmost as a very important strategic material. After collapse of the national economy by the defeat in the war, the coal industry played a very important role in the rehabilitation of the war-stricken industries. The government also took all measures to encourage the increase of the output. Annual production soon recovered the prewar level and surpassed it. In 1950's, it climbed to 50 million tons. Coal industry continued to show the signs of prosperity. Since about 1958, however, Japanese coal industry gradually turned to decline. This is not an occurrence peculiar to Japan, but it is a part of the general decline of the coal industry all over the world. The trend represents a change in the source of industrial energy from coal to petroleum, which is generally referred to as the "Energy Revolution". The consumption of petroleum, and accordingly its import, increased by leaps and bounds. The share of petroleum in the energy economy of Japan was only 12% in 1952, compared to 52% of coal and lignite. The percentage surpassed that of coal in early 1960's. In 1965, it came to 58% against 27% of coal. The demand for coal kept decreasing in spite of the efforts to maintain it. Coal mines were crowded with large heaps of stock, and many coal mines were compelled to

minimize their business or were closed. Unemployment was widespread, and depression became serious especially in coal producing regions.

The national government also had to take measures for the immediate rescue of the coal industry and its reestablishment for the future, due to the serious decline of the coal industry. Coal Industry Rationalization Act was enacted, and since 1959, many coal mines of lower productivity were closed along this policy with government subsidy and indemnity, while the more productive mines were supported with long term credits to modernize the equipments. This is the so-called "Scrap and Build Policy". Thus, the number of mines was reduced drastically, but the national output was maintained at a level of 50 million tons a year. In 1956, there were 756 coal mines in Japan. Out of these, 608 mines were closed by 1965. In the meantime, some new ones were also opened, and in 1965, there were 223 mines. Total capacity of the mines closed during this period was about 20 million tons. The number of mines, however, is not a good indicator to show the actual condition of the coal industry, because it does not show the size of mines. In the same period national coal output was slightly increased. (48.3 million tons in 1955, 50.1 million tons in 1965). During this period, the number of coal mine workers dropped from 285,598 in 1956 to 112,779 in 1965. Thus, the efficiency per worker rose considerably. (14.2 tons in 1955 vs. 38.1 tons per worker per month in 1965).

III. Effects of the decline of coal industry on coal producing regions.

The decline of the coal industry is a very serious problem in itself within the national economy. Furthermore, it caused many consequences in areas which had been producing coal, and were heavily dependent on that industry. When a mine is closed, the discharge of personnel was a serious problem. Perhaps, some of the workers were transferred to other coal mines, and this is especially true when the mine belonged to a large trust with many mines under the same system. Some of the miners switch to other mines as temporary workers, usually at lower wages. In this case, they change their mines one after another under such insecure situation, and usually end up to live on social care. Fortunately, this was the period when Japanese economy was going up, and the rapidly growing industries absorbed most of the miners. What was necessary for the government was to provide financial support for the transitional period, retraining of the workers for other jobs, (Fig. 1), housing for those who moved to other places, and transportation. However, many of the coal miners after years of experience in coal mines were very reluctant to switch to other jobs, and such are usually in older age levels. Some of them are those who have lost the will to continue to work after their discharge. The ex-miners who failed to reestablish themselves linger on in the region to cause the



Fig. 1 Retraining of the workers by Employment Promotion Corporation. Iizuka, Chikuhō region.

problems of low-standard living, dependence upon the finance of municipalities, and many others.

The blow was also heavy on those who ran businesses in the coal mine towns. When a mine is closed, sometimes more than half of the population is moved out. The recovery of credits and debts by businesses was not possible under this situation. The businesses were minimized or it was necessary to change them, but there was no chance for new ones in the deserted town. In addition, their properties depreciated greatly due to the closing of the mine.

Almost all the coal producing regions are losing population since about 1963. Concentration of population into large cities is a nationwide phenomenon, and many of Japanese prefectures and smaller cities especially in areas far from the central part of Japan have been losing population in the last decade or two. In coal producing regions, the decrease is much faster than in other areas, and very often even the cities of fairly large size, too, are losing population. Some towns and villages in coal producing regions have lost up to 40% of their population in ten years. In total, the population of Coal Producing Regions decreased by about 1% in ten years, 1955-65, and in the core regions, that is to say the Article 6 regions later explained, the ratio was about 19%.

Such a rapid decrease of population will inevitably cause many difficult problems. With suddenly shrunken revenue, local municipalities are compelled to take care of the expanded expenditures for the social care, housing, rehabilitation and so on. Running water, hospitals, schools and other public facilities have been designed on basis of the former size of population. Besides, in many cases such facilities as hospitals, running water, bus services, movie theaters and so on,

had been managed by mining companies, and ordinary citizens were also able to use them. It is evident that municipalities in the coal producing regions cannot maintain such facilities with reduced population, and accordingly, reduced revenue. These problems are beyond the capacity of municipalities in the depressed coal producing regions. Neither the prefectural governments are capable of solving such problems. Thus, it was necessary to the national government to take measures in aid of the coal producing regions.

IV. Measures in aid of the coal industry.

To answer to the difficult situations caused by the decline of the coal industry, the national government enacted several laws concerning the coal mining industry. The Coal Industry Rationalization Act was promulgated in 1959. This act is aimed mainly at the reorganization of the coal industry itself. The number of coal mines was reduced radically by shutting down many of the less productive mines with a system of subsidy and indemnity. This act also focused on other problems such as the relocation of employees, discharge allowances, and ways to fix the ratio of the payment of debts and account wages.

At the same time, the government offered long term loans to help better coal mines for the modernization of equipment and management system. The Coal Industry Rationalization Corporation was established to take care of these problems on their practical side. Much has been done since by this corporation along the line of reorganization of coal industry. The measures, however, are mainly concerned with the coal industry itself, and are not related to the solution of economic and social problems of the coal producing regions reasonably enough. They were incapable of solving the social tension accumulated in the course of the decline of coal industry.

Although the coal industry has been declining, Japanese industry, as a whole, has been progressing rapidly. Labor shortage and high wages in cities are gradually becoming obstacles to the management of factories in cities, encouraging the enterprises to look for areas where cheap labor is available. The supply of labor is now an important factor for the location of industry, and factories are gradually moving into less developed regions for this reason. What was necessary was, therefore, to take measures to ease the relocation of industries, and to set up institutions to mediate employment. A corporation for the promotion of employment was established to this end as a government institution.

The decline of coal industry is not merely a matter of a particular industry, but is a problem of regions. A special legislation in aid of coal producing regions was considered necessary, and was put into force in November 1961, as a temporary

act for five years. This is the Coal Producing Regions Development Act.

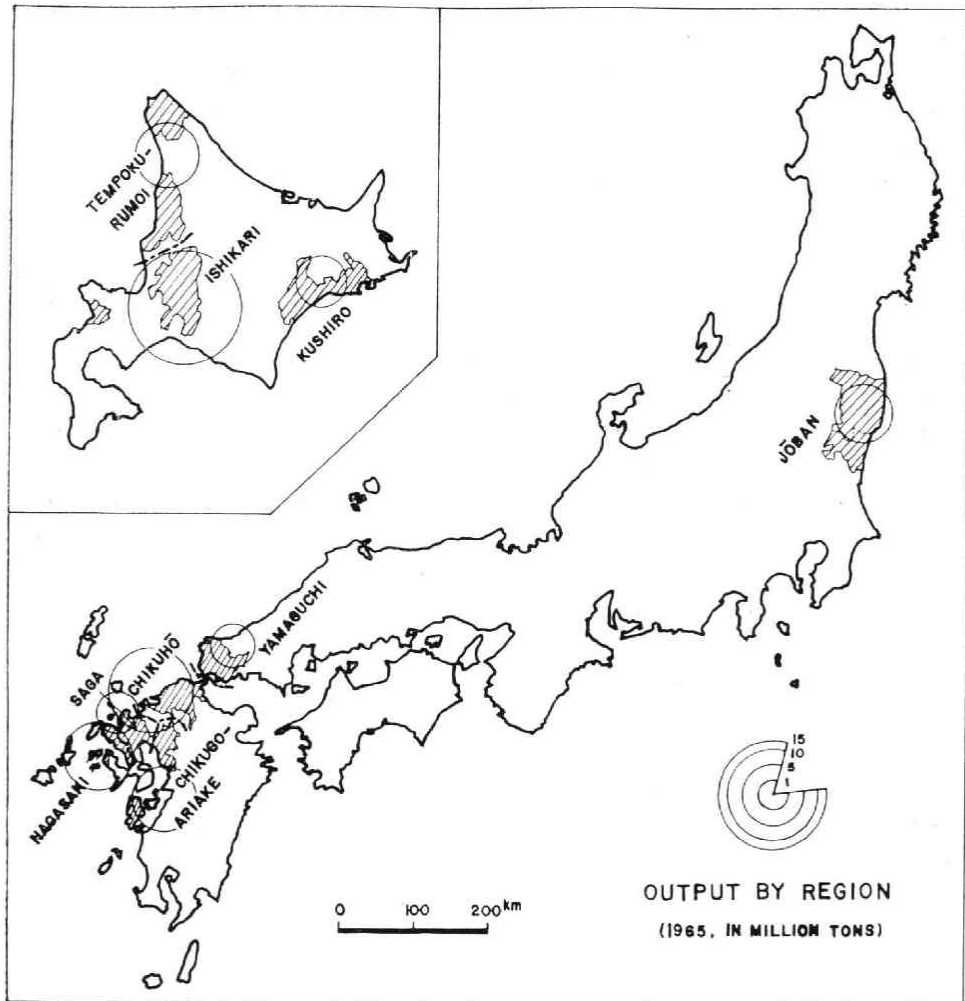
V. Legal measures taken by the government.

On November 13, 1961, the government enacted the Coal Producing Regions Development Act as a temporary act aiming at the rapid and systematic development of mining and manufacturing industries in coal producing regions, as well as the stabilization and expansion of the demand for coal. In this act, the coal producing regions are defined as such areas as are economically depressed due to the decline of the coal industry, together with the areas adjacent to them and are closely connected to them concerning the development programs of mining and manufacturing industries in the former. The coal producing regions in this sense, hereafter, will be referred to with capital letters to make distinction from the usage to mean such regions in the ordinary sense of the words. (abbreviation, CPR).

The Coal Producing Regions thus defined, are actually the areas where the coal was produced in about 1960. Since then, coal mining in many of the regions died out as a matter of fact, leaving heavy damages on the local economy. The Coal Producing Regions thus defined include 231 municipalities in 8 prefectures, covering total area of about 25,000 km², and having a population of some 7.71 million. In the act, CPR as a whole are designated in the Article 2, while 110 municipalities out of them are designated as really depressed regions by Article 6. They are called the Article 2 regions and the Article 6 regions respectively. In addition to the measures taken for the CPR, special taxation privileges are given to the Article 6 regions.

Following 9 regions are designated as Coal Producing Regions. The names of the regions and the prefectures to which they belong are: Chikuhō region (Fukuoka), Saga region (Saga), Nagasaki region (Nagasaki), Chikugo-Ariake region (Fukuoka and Kumamoto), Yamaguchi region (Yamaguchi), Jōban region (Fukushima and Ibaraki), Ishikari region (Hokkaidō), Kushiro region (Hokkaidō), and Tempoku-Rumoi region (Hokkaidō). (Fig. 2).

Main policies embodied in this act can be summarized as follows: (1) Aids to the municipalities in CPR; (2) Introduction of manufacturing industry into CPR; and (3) Improvement of basic conditions in CPR. The term "basic conditions for the industry" means all facilities such as roads, railways, ports, industrial water, communication and so on. The Ministry of International Trade and Industry is mainly responsible for the promotion of all the programs. (Perhaps, the role of this ministry in the promotion of the programs is comparable with that of the Board of Trade in the United Kingdom, in programs based on the Local Development Act of 1960.) Based on this act, the Coal Producing Regions Development



Commission was organized, and a master-plan and a working program were produced in September and November 1963, respectively. The act was originally a temporary act for five years' period of 1961-66. In 1966, it was extended for another five years in consideration of existing conditions of CPR, and the progress of the program. By the request of the Ministry of International Trade and Industry, the prefectures with CPR are to make annual reports on the progress of the program and the analysis of the effects of the program. Prefectural govern-

ments are also responsible for preparing the survey reports and to supply information on the basic conditions.

As the development of regions is a very broad and many-sided problem, other ministries of the government are also involved for the promotion of the above mentioned program. For example, the construction of national highways and main ports is in the affairs of the Ministry of Construction. It is expected that when the construction priority is discussed at the ministry, the highways and ports in CRP will be considered with a favor because of this act. Of course, the development of coal producing regions is also a matter of great concern for respective prefectures and municipalities. All the prefectural governments have been making efforts to attract manufacturing industry, and to encourage companies, legislative measures for tax exemptions and land were enacted. In making regional plans, prefectures with CPR will emphasize the reinforcement of highways, railways, ports etc. in CPR to get support from the national government. Although it is hard to estimate the total effects quantitatively, such consideration must have worked in favor of CPR. To take an example, the road system in Chikuhō CPR is well developed in its core region because of road construction in the last few years in comparison with the adjacent metropolitan area of Kitakyūshū city. Because of this act, road construction probably progressed faster than it should have been otherwise.

The case of Onahama port, Fukushima prefecture, in Jōban CPR, is another example. Coal from Jōban fields used to be shipped mainly by railways, and Onahama port played a minor part in the shipping of Jōban coal. Onahama was originally a fishing port, but since about 1929, it has changed into a commercial port. A chemical plant, the Nihon Suiso Company, which was established in 1937 became the core of the industrialization of this district after the war. As a part of its own regional development plans, Fukushima Prefecture endeavored to enlarge the port several times after the war, and more factories were built mainly in the category of chemical industry. A pier to be used exclusively for coal was constructed in 1962 with a loan from the Coal Industry Rationalization Corporation. In the meantime, Onahama was amalgamated into the Greater Iwaki city, and Fukushima prefecture included this port in its regional development programs. In 1963, Onahama was designated as a region of New Industrial City combined with the inland city of Kōriyama. Onahama, thus, is included in two regional plannings and the rate of development has become very rapid. Now it is the main port of Jōban district, and many of the development programs consider Onahama as one of the important locational factors of Jōban district.

VI. Coal Producing Regions Development Corporation.

On July 20, 1962, the Coal Producing Regions Development Corporation was organized as a government institution to take care of the practical side of the CPR development programs, based on the April 30, 1962 Act. The establishment of this corporation made the CPR development programs somewhat different from many other regional development plannings by the government. Unlike many other programs of this kind, it is supported with a large government fund through this corporation. This corporation is charged with both financial and technical aspects. The corporation helps those who want to get long term loans to start or to expand businesses in Coal Producing Regions. Such loans are granted on several conditions such as that the businesses ought to be helpful for the development of the area, and the businesses ought to hire more than 30% of their employees from those who lost jobs in closed coal mines, or their family members.

According to the annual report of the corporation, the total amount of loans given through this corporation by the end of July 1966, was 7,282 million yen to 316 enterprises. The proportion of the enterprises classified by the kind of industry was 168 million yen to the primary industries, 6,715 million yen to the secondary, and 399 million yen to the tertiary industries. By this means, opportunities of 16,694 employments were newly created, out of which 10,919 were former coal mine workers or their family members.

The introduction of manufacturing industry is considered indispensable for the development of CPR. The preparation of land for industrial estates is an important part of the work of the corporation. The corporation purchases land, constructs industrial estates, and sells the land on non-profit basis by long term instalment of up to ten years. The total area of industrial estates completed by the CPR Development Corporation by the end of May, 1957 was 4.9 million m². Another 5.7 million m² is under construction or under preparation. Sometimes, the trading estates, too, are included in this program. Of course, industrial estates are also constructed by prefectures and municipalities. The merit of this corporation is that it can invest much larger amount of money in projects within their affairs. From the nature of this corporation, they can work for industrial estates or for land which will be used for purposes closely connected to the factories. Land for housing projects, for instance, is not included in the affairs of this corporation. (Fig. 3)

Projects to secure the supply of water for industrial use were later added to the operations of the corporation. Construction of reservoirs with dams were thus carried out at numerous places in CPR to secure the water supply for the industrial estates constructed by this corporation. The largest of these projects is the



Fig. 3. Industrial estate under construction. Isohara, Jōban region.

construction of the Kurate water system in Chikuhō CPR. The corporation is now constructing about 900,000m² of industrial estates in this part of the Chikuhō region. Here, former irrigation ponds are connected with canals, and several rivers are tied with them. When this system is completed, it will supply 20,000m³ of water per day to the factories in adjacent estates.

The possible development of tourist industry was another criterion for loans which was added to the affairs of the corporation later. The basis for this extended interpretation was, perhaps, the precedents set in Western countries such as France and West Germany, where the tourist industry was included in regional development programs. For instance, aid to the tourist industry in IMNOS had been approved by the Federal Committee in West Germany. In Jōban CPR, for example, Jōban Yumoto Kankō company was established aided with a large credit from the corporation, and opened the so-called Jōban Hawaiian Center. Here, the hot water from the coal mine, which had been wasted, is used as the source of hot-water pools and to heat green houses with tropical plants. A large number of employees, including *hula* dancers, are former coal mine workers. So far, this enterprise has been very successful, and it is explained that it does not compete with the old hot-spring spa, Yumoto, but the latter area has also profited from the success of Jōban Hawaiian Center.

VII. Different problems in each of the Coal Producing Regions.

Each of the Coal Producing Regions has different geographic foundations. As it was pointed out previously, the CPR actually have not many aspects in common except that these were the regions where coal was produced in about 1960. All of

these regions were strongly affected by the decline of the coal industry, and for that reason it was necessary for the government to take measures in aid of the regions. Even when the coal industry was prosperous, the regions were very different one another. In the course of the progress of the rationalization program, the coal industry will make development very much different in each of the regions. The differentiation of the regions due to the progress of CPR development programs will be still stronger because the connection between the programs and the coal industry, in this case, is more indirect.

(1) *Hokkaidō*

The three Coal Producing Regions in Hokkaidō are Ishikari, Kushiro, and Tempoku-Rumoi regions. In all of them, working population has been decreasing since its peak in 1963. The reduction of coal mines started in 1961, while the decrease of the number of coal mine workers started in 1960. Coal mines in Hokkaidō were developed much later than those in North Kyūshū. In addition, the conditions of coal-seams are better, and coal fields in Hokkaidō are much more promising than those in other regions. The equipment of coal mines is more up-to-date and management is generally more efficient in Hokkaidō than in other CPR because of their recent development. In 1965, the share of Hokkaidō in the national coal production was 44.2%. It is expected that Hokkaidō will play the leading role in the future of Japanese coal industry. Here, too, many mines have been closed, but others will be developed as "Build" mines. In Hokkaidō, however, the main coal fields are located inland and are far from the ports. Shipping of coal to ports in a form of slurry is under investigation, but it is doubtful whether it will pay the costs for the construction.

On the other hand, locational factors are not conducive for industrialization in Hokkaidō. It is far from the central "Belt" of Japanese industrial development. Population density is much lower than national average less promising of the opportunity for labor supply. Notwithstanding the fast growth of road and railway systems in recent years, transportation is still less convenient than in other CPR.

The conditions are not very favorable in Hokkaidō for attracting factories in spite of the eager efforts of the people in charge of this affair. The enterprises newly established in CPR in Hokkaidō with the aid of the CPR Development Corporation are mostly small scale ones in such categories as food-stuff, woodwork, construction, and machines for coal mines. Future industrial growth is expected in those industries which are closely related to coal industry and forestry. Since the enactment of the CPR Development Act, the rate of road construction and their paving are much faster in CPR than elsewhere in Hokkaidō. During 1960-

64, 154 enterprises with 5,664 employees were established in CPR with support from the CPR Development Corporation, prefecture, and municipalities. The proportion by region is 154 factories in Ishikari, 32 in Kushiro, and 13 in Tempoku-Rumoi region. (Fig. 4)

Ishikari region in Hokkaidō will be the core of Japanese coal production in the future. There are many promising mines, especially those in the following three municipalities are important; namely, Utashinai, Akabira and Ashibetsu. Their populations in 1965 were Akabira 46,646, Ashibetsu 52,123, and Utashinai 27,744. In 1965, coal production from these three municipalities was 37.1% of the total production of Ishikari coal fields. Most of the coal mines are managed by large trusts like Mitsui-Ashibetsu, Sumitomo-Akabira and Sumitomo-Utashinai. (Table 1). In this district, most of the coal mine towns are developed in narrow valleys, with coal mine offices at the center, and company-built housings of the



Fig. 4. CPR in Hokkaidō and factories established with loans from CPR Development Corporation

miners are scattered in groups on the slopes of the valleys. In many cases, mining companies run stores, hospitals, movie theaters, and sometimes also take care of running water, buses and electricity. The occupational structure of the citizens in towns of this kind is very much out of balance, in spite of the large size of population. Farming is difficult because of steep slopes. Ordinary shops are hard to develop because of the competition from the company-managed stores. Factories are mostly workshops for the machines used in the mines. Under such circumstances, the blow to the community is especially hard when the coal industry is in depression or when mines are closed. (for instance, Toyosato mine in Akabira was closed in 1967). (Fig. 5).

The planning of ideal coal mine towns will also belong to the work of CPR development program. What are desired for prosperous coal mining towns are to improve the living conditions of the citizens especially the coal mine workers, and the development of well balanced communities. At present, it is of urgent



Fig. 5. Company-built miners' housings scattered in groups. Akabira, Ishikari region.

Table 1. Coal production by company. (1965)

	Output (1,000 tons)	%		Output (1,000 tons)	%
Mitsui Kōzan	7,859	15.7	Ube Kōsan	1,626	3.2
Hokkaidō Tankō Kisen	4,080	8.1	Matsushima Tankō	1,490	3.0
Sumitomo Sekitan Kōgyō	3,543	7.1	Yūbetsu Tankō	1,452	2.9
Mitsubishi Kōgyō	3,451	6.9	Meiji Kōgyō	1,368	2.7
Jōban Tankō	2,595	5.2	Total	50,113	100.0
Taihei'yō Tankō	1,764	3.5			

(Nippon Kokusei Zue, 1967)

necessity to renew the superannuated and mostly wooden housings. This alone is too large a project for individual companies or communities to take care. Special measures must be taken for this purpose. Precedents in some of the Western countries will be instructive. In Belgium, for instance, leagues of municipalities were established for this purpose. There, IDEA (*Association Intercommunale pour le Développement Economique et l'Amenagement des Régions du Centre et du Borinage*) was established for the development of coal producing regions, and especially the activity of *Sorelebo* is worthy of notice concerning the disposal of slums and construction of new housings.

Another important thing is to attract manufacturing industry to this type of municipalities. From the speciality of the area, it is not likely that ordinary factories will be attracted to coal mine towns. Factories which will use coal as raw material, along with plywood and furniture factories, will make the core of the industries together with workshops for coal mine machines.

(2) Jōban region.

This region consists of districts in Fukushima and Ibaraki prefectures. Compared to Hokkaidō and North Kyūshū, Jōban has originally been of minor importance concerning the production of coal. Coal mines in Jōban region are generally small in scale, and the quality of coal, too, is not very good. In 1965, this region contributed 7.8% to national output. When the coal industry started to decline, the blow was quick and heavy in this region. Many mines were closed, and the pressure of unemployment and shrunken circulation was strong. However, it was also fast to recover, probably because the local economy itself was of smaller momentum. Due to the unfavorable distribution of coal-seams, the northern part of this region, namely the part in Fukushima prefecture was the first to undergo such changes. In the meantime, a part of this area was combined with the city of Kōriyama more than 60 km inland, and was designated as New Industrial City in 1963. This is Jōban-Kōriyama region based on the New Industrial City Construction Act. Both prefectural and governmental policies came into play in this district. The fast development of Onahama port is one example, and the opening of a thermal electric plant with generating capacity of 525,000 kW at Nakoso is another. This thermal plant was established with a loan from the Coal Industry Rationalization Corporation to secure the demand for coal from Jōban coal mines. In recent years, many industrial estates were prepared or are under construction in this district by CPR Development Corporation as well as by prefecture and municipalities. (Fig. 6).

The circumstances in the southern part, the Ibaraki prefecture side, are

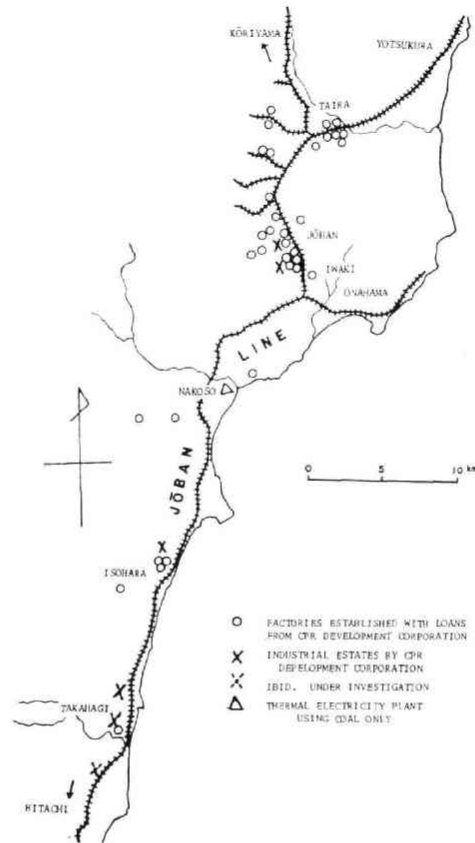


Fig. 6. Main part of Jōban region.

somewhat different. Coal-seams in this district are generally better. Besides, there is the city of Hitachi with Hitachi Seisakusho, a large company producing electric appliances, and factories of this company and many workshops related to it are distributed in this city and in its adjacent area. The decline of coal industry coincided with the prosperous period of manufacturing in general. The establishments in Hitachi absorbed the unemployed laborers, working as a buffer against the depression of coal industry. But as time went on, relative conditions gradually changed. The growth of electric machine industry slowed down, and the locational factors came to work against this district. After 1960, no factories were newly established in the Article 6 region of this part of Jōban CPR.

The local economy of the Jōban region is gradually improving since the enactment of CPR Development Act. The port of Onahama was enlarged, several

highways were widened and paved, railway transportation was strengthened, and several reservoirs were constructed to supply water to the factories. Perhaps, Jōban will be the first to recover from the depression. What then are the locational factors that helped Jōban in its recovery? Without doubt, the most important merit of this region is its closeness to the Tōkyō Metropolitan Area. Perhaps, Jōban is the most successful region of the CPR in attracting factories. Industrial estates are quickly filled with establishments moving into this district from Tōkyō, Ōsaka and other advanced areas, and this in turn helps quicken the construction of more industrial estates. (Fig. 7).

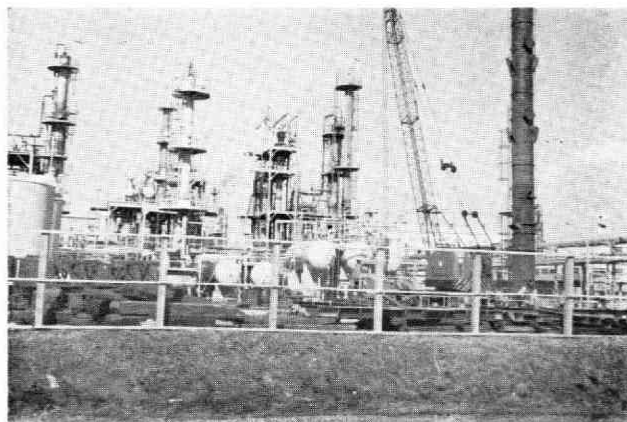


Fig. 7. New factories are established. Iwaki city, Jōban region.



Fig. 8. Jōban Hawaiian Center. (photography by Jōban Yumoto Kankō Company)

The introduction of government loans into private enterprises in tourist industry set a new precedent in Jōban region. This is the case of Jōban Yumoto Kankō Company which was mentioned above. This company is related to Jōban Coal Mine Company, and in 1965, so-called Jōban Hawaiian Center was established as an amusement and recreation center. Many of the employees are ex-miners from Jōban coal mines. So far, the business is successful attracting about 1.5 million visitors a year. Application for a loan for attached expensive hotel was not approved as it was not considered to be a project of the accomodation for general people at large. For the future of the tourist industry in this region, it is necessary to arrange tourist routes connecting the places of sight seeing interest, and to reinforce accomodations for tourists. (Fig. 8).

(3) *Yamaguchi region.*

Coal Producing Regions in Yamaguchi prefecture are in the western part of the prefecture including the coal fields of Ube-Onoda and Ōmine districts. This is the smallest of Japan's four major coal fields, and in 1965, contributed 4.2% to the national output. Ōmine coal field is well known for its anthracite production which is rare in Japan. This region is near the North Kyūshū industrial region and is located along the Inland Sea of Japan, which had since old days been the main highway of the sea. Thus, this region is favorably located, making a part of the so-called "Industrial Belt Zone", and is rather an advanced area where both industrialization and urbanization are progressed compared to regions like Hokkaidō and Jōban. It does not mean that this region was free from the adverse effects of the declining coal industry. On the contrary, the effects were severe in this region where there are coal mines within the city areas themselves like in Ube and Onoda.

The population of CPR in Yamaguchi prefecture decreased in five years from 747,261 in 1960 to 714,261 in 1965. The number of mines dropped from 57 in 1955 to 11 in 1966. Problems of this region are thus rather different from those in other regions. One of the problems is the improvement of economic conditions which are fairly high to begin with. For the prefecture, another problem is to recover the balance between this region and the eastern part of the same prefecture, which is not a coal producing area and which has achieved a fairly high development level receiving slight effects of the depression of the coal industry.

In Ube district, many of the coal mines are extended to adjacent sea bottom, and tailings from such coal mines had been used by mining companies to reclaim the shallow sea. Such reclaimed land is now going to be converted to industrial estates. In addition, a large reserve of limestone in Mine district is a factor that

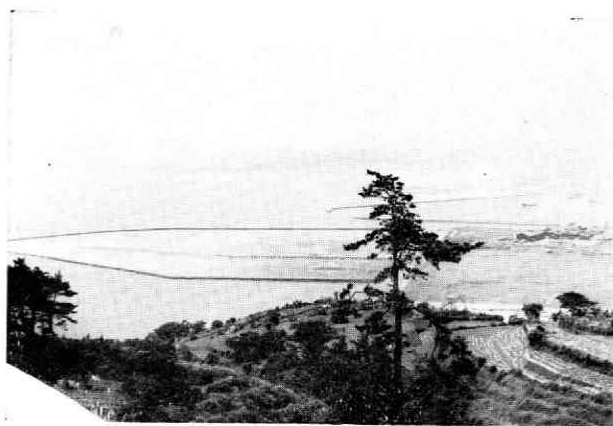


Fig. 9 Reclamation is going on along the coast, Onoda, Yamaguchi region.

encourages the development of cement and ceramic industry. (Fig. 9).

In the twin cities of Ube and Onoda, industrial estates are constructed mainly by means of filling-up with tailings from the coal mines. In Ube, more than 8.6 million m^2 of land was thus reclaimed and another one million m^2 is under construction. In many cases, the right for reclamation belonged to coal mine companies. Yamaguchi prefecture, Ube city, and CPR Development Corporation purchase reclaimed land and reinforce the filling-up or undertake new reclamation. The port of Ube consists of the eastern and the western parts, both with the capacity for five to ten thousand ton ships. The future development of manufacturing industry in this area will necessitate the enlargement of the port capacity. The supply of industrial water is also very important, and for this purpose, constructions are in progress to draw water from the Kōtō, the Asa and other rivers by means of reinforcement of the existing dams. It is expected that the petroleum refinery with related chemical industry will be developed in Ube district. The recent establishment of Seibu Oil Company seems to make a good start for the fulfilment of this expectation. Ube is the home town of Ube Kōsan Company, which originally started as a mining company but now incorporates amalgamation of manufacturing activities. The existence of such a large business in a rather small city has its merits as well as its defects. The establishment of an optimal range of factories and diversification of industries is an important consideration for the Ube-Onoda district. Onoda city has been well known with its cement industry. Here also, the reclamation is carried on along the coast where the cement factories and a thermal plant is located. (Fig. 10).



Fig. 10 Industrial estate under construction. Ube, Yamaguchi region. Background, Ube Kōsan Company.

(4) *North Kyūshū.*

For a long time, North Kyūshū has been Japan's leading coal producing area, but recently it has been giving up its lead to Hokkaidō. Its share of the national output was less than 39% in 1965. Coal fields in Kyūshū have been long since exploited. Coal-seams are thin and are often interrupted by faultings. Many of the mines are superannuated and their equipments are outdated. On the other hand, coal fields are near the industrial region of North Kyūshū, which is one of Japan's four major industrial regions, and for the development of which the adjacency of these coal fields was decisive.

The CPR in North Kyūshū are subdivided into four regions; Chikuhō, Saga, Nagasaki, and Chikugo-Ariake regions. By and large, the coal fields themselves are continuous, and the division into regions is rather a matter of administrative boundaries than by the distribution of coal fields.

(a) *Chikuhō region.*

Chikuhō is the core of the North Kyūshū coal fields. For a long time, it has been the most important coal field of Japan. This region suffered the heaviest blow from the decline of coal industry, due to its high dependence upon coal industry and high ratio of employment in coal mining. In Tagawa city, in the heart of the Chikuhō region, the declaration of the existence of an emergency status was seriously discussed in 1962. Tagawa used to have a population of a little over 100,000. In ten years, 1955-65, it lost 26% of its population. In smaller municipalities, the rate of depopulation due to the closure of mines was still higher. Shōnai-machi in

the same prefecture lost 60% of its population during the same period.

It is natural that North Kyūshū, and particularly Chikuhō region became the core region in all the programs of CPR development. The measures taken by the government and the work of the CPR Development Corporation were concentrated to this region. In addition, prefectural government and municipalities, and the citizens as a whole were very seriously concerned with the CPR development problem. The results of the efforts are gradually appearing, and many of the "Ghost towns" due to the depression of coal industry are slowly reviving, though the tempo is not considered to be very fast.

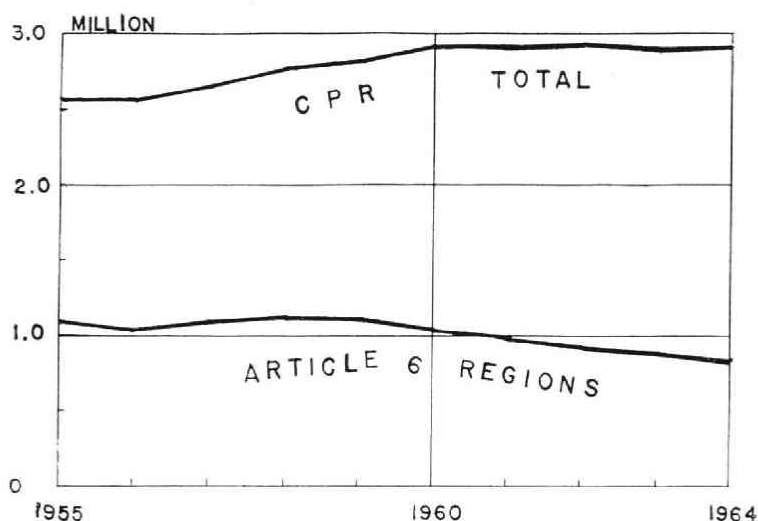


Fig. 11. Population changes in Chikuhō CPR.

In spite of many serious problems, this region is endowed with several favorable conditions, too. First of all, it is near North Kyūshū industrial region with Kitakyūshū and Fukuoka cities as its core. The iron producing city of Yawata in North Kyūshū had made an early start as the base of Japan's heavy industry. In 1963, former five cities at the northern end of Kyūshū were amalgamated to make the new Kitakyūshū city with a population of a little over a million. (this figure was reached in 1967). The five cities are; Moji, Kokura, Wakamatsu, Yawata, and Tobata. Of these five cities, Yawata has long been the center of Japan's iron and steel industry since the establishment of Yawata Iron Plant in 1901 as a government institution. In 1930, Yawata alone produced more than 40% of the national output of iron. In the manufacturing industry of Kitakyūshū city,

iron and steel industry still occupies 39.5% in the number of employees, and 48.2% in the total value of output. Chemical and ceramic industries follow it. Factories are concentrated along the long coast line of this city, and there are many wharves used exclusively for coal. (Fig. 12).

The North Kyūshū industrial region has a large concentration in heavy and chemical industries in comparison with other major industrial regions of Japan. On the other hand, it is weak in textile, clothing, furniture and other light industries. There is no doubt that the existence of the Chikuhō coal fields was a strong factor for the location of North Kyūshū industrial region. Steel plants,



Fig. 12 Wakamatsu looking towards Tobata across the port. Kitakyūshū city.

thermal electricity, and numerous factories used the coal from Chikuhō and other coal fields in northern Kyūshū. In the past, the port of Wakamatsu prospered as the shipping harbor of coal. The port handled barges and sail-and-steam ships to transport coal to Ōsaka-Kōbe and other regions. As the result of the "Energy Revolution," petroleum has replaced coal as the source of industrial energy and also as raw material for the chemical industry. Consequently, North Kyūshū lost its advantage of location. The once crowded port of Wakamatsu suffers from maritime coal transport inactivity, and the factories and residential houses are in danger of creating a slum section in Kitakyūshū city.

From the beginning, however, the connection between North Kyūshū industrial region and Chikuhō coal fields was not very strong. Each region had a different development pattern, Chikuhō as a mining area, and North Kyūshū as an industrial area. Unlike the Ruhr in West Germany, for instance, the North Kyūshū iron industry did not develop within the coal producing region itself. Also, Chikuhō

coal was mostly shipped to other industrial regions like Ōsaka-Kōbe and Tōkyō-Yokohama regions. In the North Kyūshū industrial region, materials were produced mainly to be shipped to other regions. This pattern of development caused a major economic dislocation in the Chikuhō region, while North Kyūshū received relatively slight effects. In future, a close tie between Chikuhō and North Kyūshū is desirable, especially for the development of the former. In a larger sense, however, the existence of North Kyūshū industrial region worked as a buffer for the depressed Chikuhō region. Unemployment in the latter was lessened by opportunities of employment in the former. Branches of companies in Kitakyūshū city were established in the Chikuhō area to ease the effects of depression. However, the blow was so heavy that this measure was not enough to stem the panic in the Chikuhō area.

The existence of Fukuoka city is another factor to be considered in connection with the future of Chikuhō region. Fukuoka city is the site of the prefectural government, and is the largest city of Kyūshū and also of the entire west Japan with the exception of the newly amalgamated Kitakyūshū city. Since the Edo period, Fukuoka, the castle-town of Kuroda clan, had been the administrative and commercial center. In the development of manufacturing industry, it is far behind the newly established industrial city of Kitakyūshū. Manufacturing industries now existing in Fukuoka city are mostly high industries such as food-stuff, printing, furniture and others. In recent years, however, plans for the development of Fukuoka city as an industrial city have been promoted energetically. Hakata harbor with its recently completed wharves will be the outlet for Chikuhō region and also for the entire northern Kyūshū. The importance of Fukuoka city will be



Fig. 13. Hakata harbor, Fukuoka city.

still increased when the programs to construct additional highways and railways are completed.

In output, Chikuhō used to surpass all the other coal fields in Japan. In 1959, there were 35% of coal mines, and 37% of national output was from the Chikuhō coal fields. The rationalization program carried out since 1959, therefore, had the strongest effects on the coal industry in this region. Unemployment in Fukuoka prefecture in 1962 was 112,000, and in 1964 it was 102,212. Of these, the unemployment from the coal industry was about one-fifth and reached 27.7% in 1963. The proportion of income from the coal industry within the total industries of Fukuoka prefecture dropped from 11.0% in 1958 to only 2.9% in 1964.

In Nōgata city, for example, there were about 160 small foundries working for coal mine companies. They suddenly lost their customers and were compelled to look for new markets. There were numerous small merchants and service businesses which depended upon the wages of mine workers. When coal mines were closed, these merchants were left with large amount of credits which were irrecoverable, on the top of depreciation of their property.

The Chikuhō region received a greater emphasis in the whole program of the development of Coal Producing Regions because of its position as the core of Japanese coal industry in the past. At the end of 1966, there were 19 industrial estates completed in this region, and 10 more estates were under construction by CPR Development Corporation. The total area of estates completed by May 1957 was more than 3 million m². Many ex-miners were employed in the construction. Tailings from coal mines were used as construction material for two reasons. First, tailings were available in large quantities. Second, the use of tailings disposed of the dangers from the collapse of tailing piles. (Fig. 14). Chikuhō region has origin-



Fig. 14. Coal mine tailings are used for industrial estate. Tagawa, Chikuhō region.

ally been in short of water supply, and this has been the bottle-neck in the attraction of enterprises. The CPR Development Corporation, therefore, adopted the construction of water systems as one of their important projects. Along this line, the construction of the Kurate canals was started in 1967. In this region, two dams are under construction and several others are under survey. As of September 1967, 124 enterprises have been introduced into Chikuhō region. Their total investment for fixed assets amounted to 50 billion yen. Generally speaking, these are mostly small scale enterprises. They are classified mainly as iron foundry, machine, textile, clothing, and food-stuff. In the master-plan of Fukuoka prefecture, Chikuhō region is expected to develop with machine industry as its core, and for the longer term prospect, automobile and electronic industries are anticipated. (Fig. 15).

(b) *Saga region.*

In Saga prefecture, 41 municipalities are designated as CPR which cover more than half of the prefecture. The core area stretches from the Imari bay eastwards across the central part of the prefecture. Near the eastern margin of the prefecture

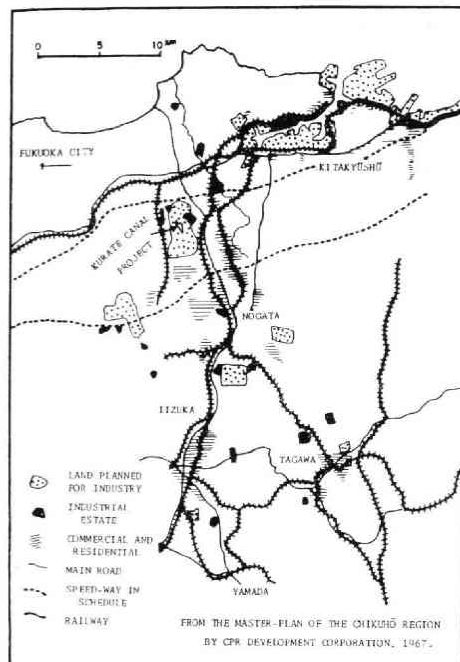


Fig. 15. Main part of Chikuhō CPR.

runs the main railway, the Kagoshima line, on which the city of Tosu is located. Saga city, the site of the prefectural government, is not too far from it. Generally speaking, the eastern and southern parts of Saga prefecture are more densely populated, and together with the adjacent part of Fukuoka prefecture, industry in cities is fairly well developed. Saga prefecture as a whole, however, is more agricultural than manufacturing, and accordingly the recovery from the depression is slow.

At Kitahata-mura, where the Karatsu Coal Mine was closed, the population decreased by 49.5% in the period of 1960-65. Thus, the Article 6 regions in Saga prefecture experienced a heavy decline. Unemployment was at its peak in 1963 reaching 126,000 in Saga prefecture, of which 27.1% was from coal mines. The percentage of those who receive social care is extremely high in Article 6 regions reaching 4.93% compared to 2.71% and 1.75% of prefectural and national average respectively. Expenditures for social care particularly put a heavy burden on the finances of municipalities.

The industrialization of the Imari bay area is now under discussion as an approach to the development of CPR, especially the core regions in the north-western part of the prefecture. In Imari city, several plywood and ceramic factories have been established along the bay in the industrial estates prepared by CPR Development Corporation. A large scale development plan for Imari bay area was first proposed by Saga prefecture. According to the master-plan by Saga prefecture, 3.75 million m² of land will be reclaimed from the shallow sea of the Imari bay within Saga prefecture. The bay will be developed as a transit depot of imported petroleum in anticipation of the time when huge oil tankers of more than 200,000 tons which cannot navigate the strait of Shimonoseki. The northern part of the bay belongs to Nagasaki prefecture, and that prefecture is also making a development plan of the Imari bay area with Matsuura city as its center. A close cooperation of these two prefectures is indispensable, if this huge plan is to succeed. (Fig. 16).

(c) *Nagasaki region.*

Coal Producing Regions in Nagasaki prefecture are in its northern and western parts. The northern region, the Kitamatsuura coal field, continues to the Karatsu coal field of Saga prefecture. The city of Matsuura is the center of this district. The decline of coal industry started in about 1960. CPR in this prefecture lost 60,000 population in four years 1960-64. There is a marked contrast between the "Build" and the "Scrap" areas. The coal fields in Nishisonoki subpeninsula are classed in the former area. Matsuura city in the north and Kōyagi-machi on an

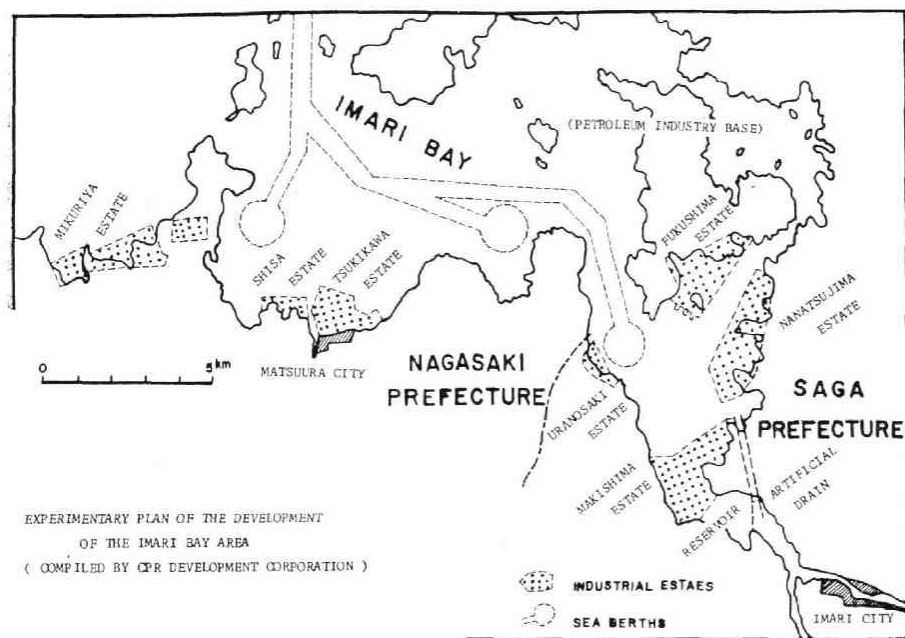


Fig. 16 Experimentary plan of the development of the Imari bay area

island near the city of Nagasaki are the cores of the depressed districts. In general, coal fields in the central and the western parts of this prefecture are, with local exceptions, endowed with better conditions, and will continue to produce coal with modernized equipment. Nagasaki city and Sasebo are the centers of these regions.

Nagasaki city is the site of the prefectural government, and large ship-yards especially that of Mitsubishi Jūkōgyō Company, where oil tankers more than 150,000 tons are built, are located here. As the size of tankers increases, the port of Nagasaki can no more boast of its matchless harbor. The Outer Port of Nagasaki is now under construction to accomodate the larger tankers and increased number of ships. According to this plan, Kōyagi-machi, a small island off the eastern shore of the bay will be land-tied. Coal mines of Kōyagi were closed a few years ago, and the town has since been suffering from the after-effects of suddenly reduced population and financial problems. The area of the Greater Nagasaki Port will be developed as a base of large scale ship-building industry, and it will attract many associated industries. Nagasaki is also an important base of the open-sea fishery. (Fig. 17).

Construction of industrial estates is now energetically carried on, mainly by Nagasaki prefecture and by CPR Development Corporation. As of September 1967,



Fig. 17. The Outer Port of Nagasaki. When the engineering is finished, Kôyagi island in the background will be land-tied.

there are 23 estates about 8 million m² in total area. Sasebo area is especially active with its ship-yards and growing commerce. Except Nagasaki city and Sasebo, manufacturing industry has not developed in this prefecture too much. Industrialization is not very promising because of its location away from the "Industrial Belt". Tourist industry is one possibility. Perhaps, the bridges already constructed and those under plannings connecting the islands with Kyūshū may be useful for the development of the tourist industry.

(d) *Chikugo-Ariake region.*

This region consists of Miike coal fields with Ōmuta (Fukuoka prefecture) and Arao (Kumamoto prefecture) as central cities, and the coal fields in Amakusa islands. In the past, chemical industry based on coal had developed in this district. Miike and Ariake coal fields in this region are favored with good conditions and will be developed as "Build" mines in the future. The depression of the coal industry, therefore, did not give a very strong effect in this area.

In the coastal districts of the main island, an industrial region with coal industry as its backbone is planned. In the inland part of the CPR, the development of manufacturing such as rubber, leather, machine, furniture etc. is in the program.

VII. Changing trends in the CPR development programs.

When the CPR Development Act was enacted, the regions had many problems in common. They were in a depression due to the decline of coal industry, and they needed help to find their way out of the difficult situation which they con-

fronted. There was an objective circumstance to make the government to treat them as regions under the same category. As time went on, however, different characteristics of the regions gradually resulted in different development. Trends of differentiation are to be seen from the programs compiled by the prefectures, and are also discernible in the paths of recovery of these regions since the formation of the CPR development programs. It is often criticized that the Development Act, at first, was aimed as an emergence aid to the depressed regions, and therefore, the measures took more social aid aspects than the economic aspects. It was necessary because there were miners out of job, businesses failed, and social tension was keen in coal producing regions.

Such, so to say, direct counter-measures, however, cannot bring a permanent solution without changes in basic regional structure. Both the government policy and the actual progress of development program turned to be more practical than ideal. It is necessary more to think of economic effects to get support from the national budget. More and more, the policies took the nature of regional development plans. When an area is fully and rationally developed, and only then, the scars from the decline of coal industry will be wiped out, and the region will be able to enjoy prosperity. It would be desirable that this target could be attained by means of the reconstruction of the coal industry, but it is improbable that this will be the solution. The factors that caused the decline still survive, and there is little hope for the revival of the coal industry in near future. The depressed coal producing regions need to have some industry to replace the coal industry they have lost.

Let us come back to the example of the Chikuhō region. There, the CPR Development Corporation is working to prepare land for industrial estates. When the estates are constructed, the ones near Kitakyūshū and Fukuoka cities attract the factories much faster than those in the heart of the Chikuhō region. If the original objective of reviving depressed coal mining areas is the basic criterion for the construction of industrial estates, emphasis should be placed in the Chikuhō region, but the demand for land close to established industrial areas would inevitably affect the direction of the construction program. Thus, we have an impression that the CPR development program is now on the halfway between the counter-measure for the depression and the regional development program on a larger scale. The Ministry of International Trade and Industry, which played the leading role in the development programs from the beginning, very naturally tends to consider the coal industry as the key to the solution. But when the development program for depressed areas gave birth to large scale regional development programs, prefectures and municipalities gradually showed greater concern in their

own development programs. It is already evident that the rationalization of coal industry cannot solve all the problems. On the other hand, large scale regional development programs are beyond the scope of the commission or the corporation for the development of Coal Producing Regions. There, the Coal Producing Regions will lose the ground to expect a treatment with a favor.

The concept of a region widely differs according to the criteria by which it is delineated. Coal Producing Regions was a category of regions when such regions were under depression, and were in need of emergence aids. Once, they had a common character in that they produced coal in about 1960. From political standpoint at that time, there were reasons to classify them in a single category as Coal Producing Regions. In seven years since the start of the program, some of the grounds to categorize them as regions of the same nature were lost. First of all, many of the regions have ceased to produce coal since. From a geographic viewpoint, it was not adequate from the beginning to call them "coal producing regions". It is much less so now that the regions have followed different trends of development in accordance with the characteristics they inherited.

Perhaps, it is too early to say that the problems of Coal Producing Regions have been basically solved. Coal Producing Regions still have many difficult problems to be solved only by the efforts of people in various fields. We cannot deny the need of special treatment to protect the interest of those regions. The success of the development programs will eventually eliminate the need to class these depressed areas as "regions". Neither it is likely that the plans for the development of CPR will be suspended in the near future, since a huge amount of capital has been invested in the project. But it is already in a stage where it is hard to manage them on bases of a concept like "Coal Producing Regions." In future, it will be necessary to reorganize the project as regional development programs in wider sense, and accordingly, with larger areal designation.

The author extends his sincere thanks to the bureaux of International Trade and Industry in Sapporo, Tōkyō, Hiroshima and Fukuoka, for the kind and generous help he received on his survey trips. Prefectural governments and municipality offices were also very helpful. The Coal Producing Regions Development Corporation kindly supplied the author with all the necessary materials. Sincere thanks are also presented to the Ministry of Education for the research grant awarded to the research group for the study on "Regional planning and regional structure."

BIBLIOGRAPHY

(all in Japanese)

- Coal Industry Rationalization Corporation:** Report of a survey on the development of basic conditions for industry, using coal mine tailings. 1963.
- Coal Producing Regions Development Corporation:** Coal Producing Regions. Monthly, since September, 1963.
- , Coal Producing Regions in Yamaguchi Prefecture, 1964, 1965.
- , Coal Producing Regions in Jōban. 1964.
- , A survey on the canals for the factory water in Kurate district, Fukuoka Prefecture. 1964, 1965.
- , A survey on the possibility of the use of coal mine tailings as an enterprise. 1965.
- , A survey on the choice of manufacturing industries to be introduced into Coal Producing Regions. 1965.
- , A survey on the regional development policies in Europe; in their relation with the coal producing regions. 1966.
- , A survey on the water supply to industrial estates. (Kyūshū District).
- , Report of a survey on the construction of modern coal mining cities. (A master-plan of Kitasorachi Industrial City). 1966.
- , Factories born in the Coal Producing Regions. 1967.
- , Reviving Coal Producing Regions. 1967.
- , Report of a survey on the master-plan of the development of Chikuhō Region. 1967.
- Daidō Tsūshinsha:** Coal year-book, by region and by coal field. 1960.
- Fukuoka City:** Hakata Harbor. Fukuoka, 1966.
- , Metropolitan master-plan of Fukuoka. 1966.
- Fukuoka Prefecture:** A survey on the progress and the effects of the Coal Producing Regions Development Program. 1965, 1966.
- , A map of Coal Producing Regions in Fukuoka Prefecture. (1:150,000). 1965.
- Fukushima Prefecture:** A survey on the promotion and analysis of Coal Producing Regions Development Program. 1965, 1966.
- Hokkaidō:** A survey on the progress and the effects of Coal Producing Regions Development Program. 1965, 1966.
- Horisaka, Masatarō:** Policies for the development of coal producing regions: a case study of examples in the United Kingdom. Kōgyō Ritchi (Industrial Location), vol. 5, no. 6. 1966.
- Ibaraki Prefecture:** A survey on the progress and the effects of the Coal Producing Regions Development Program. 1965, 1966.
- Iijima, Saburō:** Evolution of the policies for the development of Coal Producing Regions. Kōgyō Ritchi (Industrial Location), vol. 5, no. 6. 1966.
- Imari City:** Imari Bay development plan. Imari. 1967.
- Institute of Coal Economy:** Problems of coal industry; backgrounds of new coal policy. 1962.
- Japan Energy Society:** Report of a survey on the thermal plants in coal producing regions. (Fukushima Prefecture). 1963.
- Kaneo, Masato:** Kyūshū economy and the development of coal producing regions. Kōgyō Ritchi (Industrial Location), vol. 5, no. 6. 1966.
- Kawasaki, Shigeru:** Changes of mining patterns during the industrial revolution in Japan. Geographical Review of Japan, vol. 31, no. 12. 1958.
- , Changes in spatial structure of coal mine towns under depression of coal industry. Chiri Kagaku (Geographic Science), no. 3. 1964.

- Kitakyūshū City:** The City of Kitakyūshū. a master-plan of Kitakyūshū. 1964.
———, Kitakyūshū of tomorrow. 1965.
———, A city-planning map of Kitakyūshū. (1:30,000). 1965.
- Kumamoto Prefecture:** A survey on the progress and the effects of Coal Producing Regions Development Program. 1965, 1966.
- Kyūshū Economic Research Society:** An economic survey of Kyūshū speed-way nets. 1963.
———, Nōgata City: a prospect and its problems. 1966.
- Marui, Hiroshi:** Some problems of the coal labor force in the Jōban coal fields. Geographical Review of Japan, vol. 33, no. 2. 1960.
———, The expansion of coal production in the Jōban coal fields. Geographical Review of Japan, vol. 34, no. 1. 1961.
- Matsuoka, Mizuo:** Reorganization and rationalization of coal industry in postwar Kyūshū. 1954.
- Ministry of Construction. Kyūshū Bureau of Construction:** Report of a survey on the arrangement of road systems in and around North Kyūshū. 1963.
- Ministry of International Trade and Industry:** Plans for the development of Coal Producing Regions. 1953.
———, Year-book of coal and coke statistics. 1966.
———, (Bureau of Coal): Japan's coal resources: an outline of a survey on the amount of reserve, and the quality of coal. 1956.
———, (Sapporo Bureau): Outline of coal industry. 1965.
- Miyake, Hiroshi:** On the labor structure in medium and minor scale coal mines in Jōban district. Tōhoku Economy, no. 16. 1955.
- Nagasaki Prefecture:** A survey on the promotion and analysis of Coal Producing Regions Development Program. 1965, 1966.
———, A map of industrial development of Nagasaki Prefecture. 1966.
- Nishimura, Yasutaka:** Measures for the development of Coal Producing Regions. Kōgyō Ritchi (Industrial Location), vol. 5, no. 6. 1966.
- Saga Prefecture:** Reports on the promotion and analysis of Coal Producing Regions Development Program. 1965, 1966.
- Ube City:** The City of Ube. 1966.
- Utashinai City:** Utashinai; an outline of the city. 1966.
- Yamaguchi Prefecture:** A survey on the progress and the effects of Coal Producing Regions Development Program. 1965, 1966.